

**Amendments to the Claims:****Listing of Claims:**

1. (Currently amended) A method for transforming ~~and a dynamically changing~~ electronic document comprising the steps of:

providing a visual representation of ~~an original~~ one or more instances of a dynamically changing electronic document to a user;

receiving feedback from interaction by said user with said visual representation, said feedback is used to generate one or more virtual tags, said virtual tags identifying features of a portion of said one or more instances of said electronic document;

constructing one or more transformation rules using said feedback, and said one or more virtual tag~~extraction rules defining transformation of said electronic document;~~ and

applying said one or more ~~extraction~~ transformation rules to said one or more instances of said electronic document, a second electronic document having a similar structure as said one or more instances of said document or future instances ~~versions~~ of said ~~original~~ electronic document to generate a virtual page of customized content extracted from said one or more instances of said electronic document, said second electronic document having a similar structure as said original document or said future versions of said electronic document; and

providing a visual representation of said virtual page.

2. (Currently amended) The method of claim 1 wherein said electronic document is a Web page and said future ~~instance~~ version is a more recent version of said Web page.

3. (Canceled).

4. (Currently amended) The method of claim ~~3~~ 1 further comprising the step of:  
storing said one or more virtual tags with said one or more transformation rules as a respective one or more virtual tag objects in a virtual tag repository; and

retrieving said one or more stored virtual tag objects from said virtual repository when subsequently accessing said electronic document, said stored one or more transformation rules being used to generate said virtual page.

5. (Currently amended) ~~The method of claim 3~~ A method for transforming and electronic document comprising the steps of:

providing a visual representation of an original electronic document to a user;  
receiving feedback from interaction by said user with said visual representation, said  
feedback is used to generate one or more virtual tags, said virtual tags identifying features of a  
portion of said original electronic document;

constructing one or more transformation rules using said feedback, said one or more  
transformation rules defining transformation of said electronic document; and

applying said one or more transformation rules to said electronic document, a second  
electronic document or future instances of said original document to generate a virtual page of  
customized content wherein said one or more virtual tags and said one or more transformation rules are determined by the steps of:

a. selecting one or more document elements for inclusion or exclusion in said virtual page from said visual representation of said original electronic document using a graphical user interface;

b. identifying said selected document elements using features of a personal data content mining (PDCM) feature set and an intent of said user to include or exclude said document element in said virtual page;

c. collecting said identified document elements into a set; and

d. applying a classification algorithm to said set to classify said one or more document elements into a respective said one or more virtual tags and generate said one or more transformation rules.

6. (Original) The method of claim 5 wherein after said step d. of applying a classification algorithm further comprising the steps of:

e. indicating said one or more virtual tags to said user at said visual representation;  
and

f. approving said indicated one or more virtual tags; or

g. disapproving said indicated one or more virtual tags, wherein when said indicated one or more virtual tags are disapproved repeating step a. through step e.

7. (Original) The method of claim 5 wherein said original electronic document is an original Web page said PDCM feature set comprises element description space features.

8. (Original) The method of claim 7 wherein said element description space features comprise one or more of the following features:

bold, not bold, italic, not italic, underline, not underline, superscript, subscript, normal type, number of links encountered before which document element within a current nested structure, size of a font, foreground color, background color, font face, surrounding header level, immediately preceding header level, immediately preceding comment text, table body, header, footer, caption, not a caption, cascading style sheet class, beginning of the current nested structure, amount of preceding visual space, pattern of preceding visual breaks, number of preceding visual breaks, path through a nested structure of said original Web page, table row at a document structure depth, table column at a document structure depth, and item count at a document structure depth.

9. (Original) The method of claim 5 wherein said original electronic document is an original Web page said PDCM feature set comprises path feature space features.

10. (Original) The method of claim 9 wherein said path feature space features comprise one or more of the following features:

a sequence, number of line breaks in a sequence, number of table cells in one row in a sequence, number of table cells in one column in a sequence, relativized feature space attributes, and number of preceding visual breaks of an item list number at a document structure depth.

11. (Original) The method of claim 5 further comprising the steps of:  
determining stability of each of said features of said PDCM feature set; and  
selecting said features of said PDCM feature set having a highest stability in said step d.  
of applying said classification algorithm.

12. (Currently amended) ~~The method of claim 3~~ A method for transforming and electronic document comprising the steps of:

providing a visual representation of an original electronic document to a user;  
receiving feedback from interaction by said user with said visual representation, said feedback is used to generate one or more virtual tags, said virtual tags identifying features of a portion of said original electronic document;

constructing one or more transformation rules using said feedback, said one or more transformation rules defining transformation of said electronic document; and

applying said one or more transformation rules to said electronic document, a second electronic document or future instances of said original document to generate a virtual page of customized content wherein said original electronic document is an original Web page said one or more virtual tags and said one or more ~~extraction~~-transformation rules are determined by:

determining structural relationships of said original Web page to form a tree structure;

selecting one or more structural objects from said visual presentation of said original Web page;

selecting one or more document elements for inclusion or exclusion in said virtual Web page from said visual representation of said original Web page using a graphical user interface;

identifying said selected document elements using features of personal data content mining a (PDCM) feature set and an intent of said user to include or exclude said document element in said virtual Web page;

collecting said identified document elements into a set;

applying a classification algorithm to said set to classify said one or more document elements into a respective said one or more virtual tags as one or more first virtual tags;

determining one or more second virtual tags from said feedback and said one or more structural objects;

associating said one or more second virtual tags to said tree structure; and

applying learning to associate said one or more first virtual tags to said one or more second virtual tags and to generate said one or more transformation rules.

13. (Currently amended) The method of claim 4 wherein said virtual page is generated by the steps of:

h. building a tree structure of said ~~original~~-one or more instances of said electronic document;

i. selecting a leaf table of said tree structure;

j. determining a plurality of ordering schemes for said virtual tag objects;

k. matching said virtual tag objects to said ordering schemes for a leaf of said leaf table;

l. selecting an ordering scheme for said leaf;

m. replacing a parent leaf of said leaf table with said selected ordering; and

n. determining if a next leaf is a tree root, wherein if said next leaf is a tree root determining an outline from said ordering of virtual tags as a virtual page or if said next leaf is not a tree root repeating step h through step n.

14. (Original) The method of claim 4 wherein said virtual page is generated by the steps of:

o. selecting one of said one or more retrieved virtual tag objects;

p. determining said one or more virtual tag objects associated with said selected retrieved virtual tag object;

q. determining a relative path definition between said selected retrieved virtual tag object and said determined associated virtual tag objects; and

r. determining if said relative path definition has been determined for all of said virtual tag objects, wherein if said relative path definition has been determined for all of said virtual tag objects, creating a virtual page from said retrieved virtual tag objects and said relative path definition or if said relative path definition has not been determined for all of said virtual tag objects repeating step o. through step r.

15. (Currently amended) The method of claim 3-1 wherein a first said one or more virtual tags is a portion of said ~~original one or more instances of said~~ electronic document to be cut and a second one of said one or more virtual tags is a portion of said electronic document to be pasted and said one or more transformation rules being constructed from said first virtual tag and said second virtual tag for determining a cut and paste operation.

16. (Currently amended) ~~The method of claim 5~~ A method for transforming and electronic document comprising the steps of:

providing a visual representation of an original electronic document to a user;

receiving feedback from interaction by said user with said visual representation, said feedback is used to generate one or more virtual tags, said virtual tags identifying features of a portion of said original electronic document;

constructing one or more transformation rules using said feedback, said one or more transformation rules defining transformation of said electronic document; and

applying said one or more transformation rules to said electronic document, a second electronic document or future instances of said original document to generate a virtual page of customized content wherein said one or more virtual tags and said one or more transformation rules are determined by the steps of:

a. selecting one or more document elements for inclusion or exclusion in said virtual page from said visual representation of said original electronic document using a graphical user interface;

b. identifying said selected document elements using features of a personal data content mining (PDCM) feature set and an intent of said user to include or exclude said document element in said virtual page;

c. collecting said identified document elements into a set; and

d. applying a classification algorithm to said set to classify said one or more document elements into a respective said one or more virtual tags and generate said one or more transformation rules wherein said one or more transformation rules are applied to a more recent version of said original Web page.

17. (Currently amended) The method of claim 3-1 wherein said one or more virtual tags is a portion of a Web page to be formatted for determining a presentation of said virtual page.

18. (Original) The method of claim 17 wherein said one or more transformation rules are applied to a more recent version of said original Web pages.

19. (Currently amended) The method of claim 3-1 wherein said one or more virtual tags are generated by the steps of:

categorizing all elements of said original Web page one or more instances of said electronic document as a plurality of OLAP cubes;

determining assignment of said feedback to said OLAP cubes; and  
browsing said cubes to create said one or more virtual tags.

20. (Currently amended) The method of claim 4 further comprising the steps of:  
building a tree representation of said ~~original~~ one or more instances of said electronic document; and

determining a document scheme from said tree representation of said ~~original~~ one or more instances of said electronic document and a tree structure of alternate versions of said ~~original~~ one or more instances of said electronic document.

21. (Currently amended) The method of claim 20 further comprising the steps of:  
determining if a more recent version of said ~~original~~ one or more instances of said electronic document has a document scheme similar to said determined document scheme,  
wherein if said more recent version of said ~~original~~ one or more instances of said electronic document has a document scheme similar to said determined document scheme,  
creating said virtual page from said retrieved one or more virtual tag objects and said most recent version of said ~~original~~ one or more instances of said electronic document;

if said ~~subsequent original~~ more recent version of said one or more instances of said electronic document does not have a document scheme similar to said determined document scheme, revising said virtual tags and said one or more transformation rules; and

creating said virtual page from said most recent version of said ~~original~~ one or more instances of said electronic document with said revised one or more virtual tags and said revised one or more ~~extraction~~ transformation rules.

22. (Currently amended) The method of claim 21 wherein if said ~~subsequent original~~ more recent version of said one or more instances of said electronic document does not have a document scheme similar to said determined document scheme, further comprising the step of:

marking said virtual tags and said transformation rules as expired.

23. (Original) The method of claim 4 further comprising the steps of:  
monitoring consecutive instances of said stored one or more virtual tags;  
categorizing the type of said stored one or more virtual tag having consecutive instances with characteristics to form a definition for said one or more virtual tags; and

matching related one or more virtual tags to form a virtual link in said virtual tag repository.

24. (Original) The method of claim 4 wherein said virtual tag object is formatted as an extensible markup language (XML) view.

25. (Original) The method of claim 1 wherein said visual representation is accessed with a graphical user interface.

26. (Original) The method of claim 1 wherein said graphical user interface includes a proxy for monitoring actions of said user.

27. (Currently amended) The method of claim 3-1 further comprising the step of: monitoring the one or more virtual tags and the one or more transformation rules.

28. (Original) The method of claim 27 wherein said monitoring step provides microstatistics of the use of said one or more virtual tags and said one or more transformation rules.

29. (Original) The method of claim 27 wherein said monitoring step provides monitoring of a user subscription to said one or more virtual tags or one or more transformation rules.

30. (Original) The method of claim 27 wherein said monitoring step further comprises the step of:

sending a message to a content provider after creation of predefined one or more of said virtual tags.

31. (Currently amended) The method of claim 3-1 wherein said one or more virtual tags previously constructed are used for constructing one or more new virtual tags and one or more new transformation rules.

32. (Original) The method of claim 1 further comprising the step of: linking said transformation rules to parameterized pages.

33. (Currently amended) The method of claim 1 wherein said ~~original~~ one or more instances of said electronic document is a chapter of a book and said second electronic document is a plurality of chapters of said book.



34. (Currently amended) A system for transforming ~~an~~ a dynamically changing electronic document comprising:

means for providing a visual representation of an original one or more instances of a dynamically changing electronic document to a user;

means for receiving feedback from interaction by said user with said visual representation, said feedback is used to generate one or more virtual tags, said virtual tags identifying features of a portion of said one or more instances of said electronic document;

means for constructing one or more transformation rules using said feedback, and said one or more transformation rules defining transformation of said electronic document virtual tags; and

means for applying said one or more extraction-transformation rules to said one or more instances of said electronic document, a second electronic document having a similar structure as said one or more instances of said electronic document or future instances-versions of said original-electronic document to generate a virtual page of customized content extracted from said one or more instances of said electronic document, said second electronic document having a similar structure as said original document or said future versions of said one or more instances of said electronic document.

35. (Currently amended) The system of claim 34 wherein said electronic document is a Web page and said future instance-version is a more recent version of said Web page.

36. (Canceled).

37. (Currently amended) The system of claim ~~36~~ 34 further comprising:

means for storing said one or more virtual tags with said one or more transformation rules as a respective one or more virtual tag objects in a virtual repository; and

means for retrieving said one or more stored virtual tag objects from said virtual repository when subsequently accessing said electronic document, said stored one or more extraction-transformation rules being used to generate said virtual page.

38. (Currently amended) ~~The system of claim 35~~ A system for transforming an electronic document comprising:

means for providing a visual representation of an original electronic document to a user;

means for receiving feedback from interaction by said user with said visual representation, said feedback is used to generate one or more virtual tags, said virtual tags identifying features of a portion of said original electronic document;

means for constructing one or more transformation rules using said feedback, said one or more transformation rules defining transformation of said electronic document; and

means for applying said one or more transformation rules to said electronic document, a second electronic document or future instances of said original document to generate a virtual page of customized content wherein said means for constructing one or more extraction transformation rules comprises:

means for selecting one or more document elements for inclusion or exclusion in said virtual page from said visual representation of said original electronic document using a graphical user interface;

means for identifying said selected document elements using features of a personal data content mining (PDCM) feature set and an intent of said user to include or exclude said document element in said virtual page;

means for collecting said identified document elements into a set; and

means for applying a classification algorithm to said set to classify said one or more document elements into a respective said one or more virtual tags and generate said one or more transformation rules.

39. (Currently amended) The system of claim 38 further comprising:

means for indicating said one or more virtual tags to said user at said visual representation; and

means for approving said indicated one or more virtual tags; or

means for disapproving said indicated one or more virtual tags, wherein when said indicated one or more virtual tags are disapproved determining revised one or more virtual tags and applying said determined revised one or more virtual tags to said means for constructing one or more transformation rules~~means for indicated said one or more virtual tags to said user at said visual representation and means for approving said indicated virtual tags.~~

40. (Original) The system of claim 38 wherein said electronic document is a Web page PDCM feature set comprises element description space features.

41. (Original) The system of claim 40 wherein said element description space features comprise one or more of the following features:

bold, not bold, italic, not italic, underline, not underline, superscript, subscript, normal type, number of links encountered before which document element within a current nested structure, size of a font, foreground color, background color, font face, surrounding header level, immediately preceding header level, immediately preceding comment text, table body, header, footer, caption, not a caption, cascading style sheet class, beginning of the current nested structure, amount of preceding visual space, pattern of preceding visual breaks, number of preceding visual breaks, path through a nested structure of said original Web page, table row at a document structure depth, table column at a document structure depth, and item count at a document structure depth.

42. (Original) The system of claim 38 wherein said original electronic document is an original Web page said PDCM feature set comprises path feature space features.

43. (Original) The system of claim 42 wherein said path feature space features comprise one or more of the following features:

a sequence, number of line breaks in a sequence, number of table cells in one row in a sequence, number of table cells in one column in a sequence, relativized feature space attributes, and number of preceding visual breaks of an item list number at a document structure depth.

44. (Original) The system of claim 38 further comprising:  
means for determining stability of each of said features of said PDCM feature set; and  
means for selecting said features of said PDCM feature set having a highest stability in said means for applying said classification algorithm.

45. (Currently amended) ~~The system of claim 36~~ A system for transforming an electronic document comprising:

means for providing a visual representation of an original electronic document to a user;

means for receiving feedback from interaction by said user with said visual representation, said feedback is used to generate one or more virtual tags, said virtual tags identifying features of a portion of said original electronic document;

means for constructing one or more transformation rules using said feedback, said one or more transformation rules defining transformation of said electronic document; and

means for applying said one or more transformation rules to said electronic document, a second electronic document or future instances of said original document to generate a virtual page of customized content wherein said original electronic document is an original Web page said one or more virtual tags and said one or more transformation rules are determined by:

means for determining structural relationships of said original Web page to form a tree structure;

means for selecting one or more structural objects from said visual presentation of said original Web page;

means for selecting one or more document elements for inclusion or exclusion in said virtual Web page from said visual representation of said original Web page using a graphical user interface;

means for identifying said selected document elements using features of personal data content mining a (PDCM) feature set and an intent of said user to include or exclude said document element in said virtual Web page;

means for collecting said identified document elements into a set;

means for applying a classification algorithm to said set to classify said one or more document elements into a respective said one or more virtual tags as one or more first virtual tags;

means for determining one or more second virtual tags from said feedback and said one or more structural objects;

means for associating said one or more second virtual tags to said tree structure; and

means for applying learning to associate said one or more first virtual tags to said one or more second virtual tags and to generate said one or more transformation rules.

46. (Currently amended) The system of claim 37 wherein said virtual page is generated by:

means for building a tree structure of said ~~original~~ one or more instances of said electronic document;

means for selecting a leaf table of said tree structure;

means for determining a plurality of ordering schemes for said virtual tag objects;

means for matching said virtual tag objects to said ordering schemes for a leaf of said leaf table;

means for selecting an ordering scheme for said leaf;

means for replacing a parent leaf of said leaf table with said selected ordering; and

means for determining if a next leaf is a tree root, wherein if said next leaf is a tree root determining an outline from said ordering of virtual tags as said virtual page.

47. (Original) The system of claim 37 wherein said virtual page is generated by:

means for selecting one of said one or more retrieved virtual tag objects;

means for determining said one or more virtual tag objects associated with said selected retrieved virtual tag object;

means for determining a relative path definition between said selected retrieved virtual tag object and said determined associated virtual tag objects; and

means for determining if said relative path definition has been determined for all of said virtual tag objects, wherein if said relative path definition has been determined for all of said virtual tag objects, creating a virtual page from said retrieved virtual tag objects and said relative path definition.

48. (Currently amended) The system of claim ~~36-34~~ wherein a first said one or more virtual tags is a portion of said ~~original~~ one or more instances of said electronic document to be cut and a second one of said one or more virtual tags is a portion of said electronic document to be pasted and said one or more transformation rules being constructed from said first virtual tag and said second virtual tag for determining a cut and paste operation.

49. (Currently amended) ~~The system of claim 48~~ A system for transforming an electronic document comprising:

means for providing a visual representation of an original electronic document to a user;  
means for receiving feedback from interaction by said user with said visual representation, said feedback is used to generate one or more virtual tags, said virtual tags identifying features of a portion of said original electronic document;

means for constructing one or more transformation rules using said feedback, said one or more transformation rules defining transformation of said electronic document; and

means for applying said one or more transformation rules to said electronic document, a second electronic document or future instances of said original document to generate a virtual page of customized content wherein said means for constructing one or more transformation,

a first said one or more virtual tags is a portion of said original electronic document to be cut and a second one of said one or more virtual tags is a portion of said electronic document to be pasted and said one or more transformation rules being constructed from said first virtual tag and said second virtual tag for determining a cut and paste operation, wherein said one or more transformation rules are applied to a more recent version of said original Web page.

50. (Currently amended) The system of claim ~~36~~34 wherein said one or more virtual tags is a portion of a Web page to be formatted for determining a presentation of said virtual page.

51. (Original) The system of claim 50 wherein said one or more transformation rules are applied to a more recent version of said original Web page.

52. (Currently amended) The system of claim ~~36~~34 wherein said one or more virtual tags are generated by:

means for categorizing all elements of said ~~original~~ one or more instances of said electronic document as a plurality of OLAP cubes;

means for determining assignment of said feedback to said OLAP cubes; and

means for browsing said OLAP cubes to create said one or more virtual tags.

53. (Currently amended) The system of claim 37 comprising:

means for building a tree representation of said ~~original~~ one or more instances of said electronic document; and

means for determining a document scheme from said tree representation of said original electronic document and a tree structure of alternate versions of said original electronic document.

54. (Currently amended) The system of claim 53 further comprising:

means for determining if a more recent version of said ~~original~~ one or more instances of said electronic document has a document scheme similar to said determined document scheme,

means for creating said virtual page from said retrieved one or more virtual tag objects and said most recent version of said ~~original~~ one or more instances of said electronic document, if said more recent version of said original electronic document has a document scheme similar to said determined document scheme; or

means for revising said virtual tags and said one or more transformation rules, if said ~~subsequent original~~ more recent version of said one or more instances of said electronic document does not have a document scheme similar to said determined document scheme; and

means for creating said virtual page from said most recent version of said original electronic document with said revised one or more virtual tags and said revised one or more ~~extraction~~ transformation rules.

55. (Currently amended) The system of claim 54 further comprising:

means for marking said virtual tags and said transformation rules as expired, if said ~~subsequent original~~ more recent version of said one or more instances of said electronic document does not have a document scheme similar to said determined document scheme.

56. (Original) The system of claim 37 further comprising:

means for monitoring consecutive instances of said stored one or more virtual tags;

means for categorizing the type of said stored one or more virtual tags having consecutive instances with characteristics to form a definition for said one or more virtual tags; and

means for matching related one or more virtual tags to form a virtual link in said virtual tag repository.

57. (Original) The system of claim 37 wherein said virtual tag object is formatted as an extensible markup language (XML) view.

58. (Original) The system of claim 34 wherein said visual representation is accessed with a graphical user interface.

59. (Original) The system of claim 34 wherein said graphical user interface includes a proxy for monitoring actions of said user.

60. (Original) The system of claim 37 further comprising:  
means for monitoring the one or more virtual tags and the one or more transformation rules.

61. (Currently amended) The system of claim 60 wherein said ~~monitoring~~ means for monitoring provides microstatistics of the use of said one or more virtual tags and said one or more transformation rules.

62. (Currently amended) The system of claim 60 wherein said ~~monitoring~~ means for monitoring provides monitoring of a user subscription to said one or more virtual tags or one or more transformation rules.

63. (Currently amended) The system of claim 60 wherein said ~~monitoring~~ means for monitoring further comprises means for sending a message to a content provider after creation of predefined one or more of said virtual tags.

64. (Original) The system of claim 37 wherein said one or more virtual tags previously constructed are used for constructing one or more new virtual tags and one or more new transformation rules.

65. (Original) The system of claim 34 further comprising:  
means for linking said transformation rules to parameterized pages.

66. (Currently amended) The system of claim 34 wherein said ~~original one or more instances of said~~ electronic document is a chapter of a book and said second electronic document is a plurality of chapters of said book.

67. (Currently amended) A computer program product for transforming ~~an a~~ dynamically changing electronic document comprising:

means for providing a visual representation of an ~~original one or more instances of a~~ dynamically changing electronic document to a user;



means for receiving feedback from interaction by the user with the visual representation, said feedback is used to generate one or more virtual tags, said virtual tags identifying features of a portion of said one or more instances of said electronic document;

means for constructing one or more transformation rules using said feedback, ~~said transformation rules defining customization of electronic document~~ and said one or more virtual tags; and

means for applying said one or more ~~extraction-transformation~~ rules to said one or more instances of said electronic document, a second electronic document having a similar structure as said one or more instances of said electronic document or future instances-versions of said original-electronic document to generate a virtual page of customized content extracted from said one or more instances of said electronic document, said second electronic document having a similar structure as said one or more instances of said electronic document or said future versions of said electronic document.

68. (Currently amended) The computer program product of claim 67 wherein said electronic document is a Web page and said future ~~instance-version~~ is a more recent version of said original Web page.

69. (Canceled).

70. (Currently amended) The computer program product of claim ~~69-67~~ further comprising:

means for storing said one or more virtual tags with said one or more transformation rules as a respective one or more virtual tag objects in a virtual repository; and

means for retrieving said one or more stored virtual tag objects from said virtual repository when subsequently accessing said electronic document, said stored one or more transformation rules being used to generate said virtual page.

71. (Currently amended) ~~The computer program product of claim 68~~ A computer program product for transforming an electronic document comprising:

means for providing a visual representation of an original electronic document to a user;

means for receiving feedback from interaction by said user with said visual representation, said feedback is used to generate one or more virtual tags, said virtual tags identifying features of a portion of said original electronic document;

means for constructing one or more transformation rules using said feedback, said one or more transformation rules defining transformation of said electronic document; and

means for applying said one or more transformation rules to said electronic document, a second electronic document or future instances of said original document to generate a virtual page of customized content wherein said means for constructing one or more transformation,

wherein said means for constructing one or more ~~extraction~~-transformation rules comprises:

means for selecting one or more document elements for inclusion or exclusion in said virtual page from said visual representation of said original electronic document using a graphical user interface;

means for identifying said selected document elements using features of a personal data content mining (PDCM) feature set and an intent of said user to include or exclude said document element in said virtual page;

means for collecting said identified document elements into a set; and

means for applying a classification algorithm to said set to classify said one or more document elements into a respective said one or more virtual tags and generate said one or more transformation rules.

72. (Original) The computer program product of claim 71 further comprising:

means for indicating said one or more virtual tags to said user at said visual representation; and

means for approving said indicated one or more virtual tags; or

means for disapproving said indicated one or more virtual tags, wherein when said indicated one or more virtual tags are disapproved determining revised one or more virtual tags and applying said means for indicated said one or more virtual tags to said user at said visual representation and means for approving said indicated virtual tags.

73. (Original) The computer program product of claim 71 wherein said original electronic document is an original Web page said PDCM feature set comprises element description space features.

74. (Original) The computer program product of claim 73 wherein said element description space features comprise one or more of the following features:

bold, not bold, italic, not italic, underline, not underline, superscript, subscript, normal type, number of links encountered before which document element within a current nested structure, size of a font, foreground color, background color, font face, surrounding header level, immediately preceding header level, immediately preceding comment text, table body, header, footer, caption, not a caption, cascading style sheet class, beginning of the current nested structure, amount of preceding visual space, pattern of preceding visual breaks, number of preceding visual breaks, path through a nested structure of said original Web page, table row at a document structure depth, table column at a document structure depth, and item count at a document structure depth.

75. (Original) The computer program product of claim 71 wherein said original electronic document is an original Web page said PDCM feature set comprises path feature space features.

76. (Original) The computer program product of claim 75 wherein said path feature space features comprise one or more of the following features:

a sequence, number of line breaks in a sequence, number of table cells in one row in a sequence, number of table cells in one column in a sequence, relativized feature space attributes, and number of preceding visual breaks of an item list number at a document structure depth.

77. (Original) The computer program product of claim 71 further comprising:  
means for determining stability of each of said features of said PDCM feature set; and  
means for selecting said features of said PDCM feature set having a highest stability in said means for applying said classification algorithm.

78. (Currently amended) ~~The computer program product of claim 69~~ A computer program product for transforming an electronic document comprising:

means for providing a visual representation of an original electronic document to a user;

means for receiving feedback from interaction by said user with said visual representation, said feedback is used to generate one or more virtual tags, said virtual tags identifying features of a portion of said original electronic document;

means for constructing one or more transformation rules using said feedback, said one or more transformation rules defining transformation of said electronic document; and

means for applying said one or more transformation rules to said electronic document, a second electronic document or future instances of said original document to generate a virtual page of customized content wherein said means for constructing one or more transformation,

wherein said original electronic document is an original Web page said one or more virtual tags and said one or more ~~extraction~~-transformation rules are determined by:

means for determining structural relationships of said original Web page to form a tree structure;

means for selecting one or more structural objects from said visual presentation of said original Web page;

means for selecting one or more document elements for inclusion or exclusion in said virtual Web page from said visual representation of said original Web page using a graphical user interface;

means for identifying said selected document elements using features of personal data content mining a (PDCM) feature set and an intent of said user to include or exclude said document element in said virtual Web page;

means for collecting said identified document elements into a set;

means for applying a classification algorithm to said set to classify said one or more document elements into a respective said one or more virtual tags as one or more first virtual tags;

means for determining one or more second virtual tags from said feedback and said one or more structural objects;

means for associating said one or more second virtual tags to said tree structure; and

means for applying learning to associate said one or more first virtual tags to said one or more second virtual tags and to generate said one or more transformation rules.

79. (Currently amended) The computer program product of claim 70 wherein said virtual page is generated by:

means for building a tree structure of said ~~original~~ one or more instances of said electronic document;

means for selecting a leaf table of said tree structure;

means for determining a plurality of ordering schemes for said virtual tag objects;

means for matching said virtual tag objects to said ordering schemes for a leaf of said leaf table;

means for selecting an ordering scheme for said leaf;

means for replacing a parent leaf of said leaf table with said selected ordering; and

means for determining if a next leaf is a tree root, wherein if said next leaf is a tree root determining an outline from said ordering of virtual tags as said virtual page.

80. (Original) The computer program product of claim 70 wherein said virtual page is generated by:

means for selecting one of said one or more retrieved virtual tag objects;

means for determining said one or more virtual tag objects associated with said selected retrieved virtual tag object;

means for determining a relative path definition between said selected retrieved virtual tag object and said determined associated virtual tag objects; and

means for determining if said relative path definition has been determined for all of said virtual tag objects, wherein if said relative path definition has been determined for all of said virtual tag objects, creating a virtual page from said retrieved virtual tag objects and said relative path definition.

81. (Currently amended) The computer program product of claim 70 wherein a first said one or more virtual tags is a portion of said ~~original~~ one or more instances of said electronic document to be cut and a second one of said one or more virtual tags is a portion of said electronic document to be pasted and said one or more transformation rules being constructed from said first virtual tag and said second virtual tag for determining a cut and paste operation.

82. (Currently amended) ~~The computer program product of claim 81~~ A computer program product for transforming an electronic document comprising:

means for providing a visual representation of an original electronic document to a user;  
means for receiving feedback from interaction by said user with said visual representation, said feedback is used to generate one or more virtual tags, said virtual tags identifying features of a portion of said original electronic document;

means for constructing one or more transformation rules using said feedback, said one or more transformation rules defining transformation of said electronic document; and

means for applying said one or more transformation rules to said electronic document, a second electronic document or future instances of said original document to generate a virtual page of customized content;

a first said one or more virtual tags is a portion of said original electronic document to be cut and a second one of said one or more virtual tags is a portion of said electronic document to be pasted and said one or more transformation rules being constructed from said first virtual tag and said second virtual tag for determining a cut and paste operation;

wherein said one or more transformation rules are applied to a more recent version of said original Web page.

83. (Original) The computer program product of claim 70 wherein said one or more virtual tags is a portion of a Web page to be formatted for determining a presentation of said virtual page.

84. (Original) The computer program product of claim 83 wherein said one or more transformation rules are applied to a more recent version of said original Web page.

85. (Currently amended) The computer program product of claim 70 wherein said one or more virtual tags are generated by:

means for categorizing all elements of said ~~original~~ one or more instances of said electronic document as a plurality of OLAP cubes;

means for determining assignment of said feedback to said OLAP cubes; and

means for browsing said OLAP cubes to create said one or more virtual tags.

86. (Currently amended) The computer program product of claim 70 comprising:

means for building a tree representation of said ~~original~~ one or more instances of said electronic document; and

means for determining a document scheme from said tree representation of said original electronic document and a tree structure of alternate versions of said original electronic document.

87. (Currently amended) The computer program product of claim 86 further comprising:

means for determining if a more recent version of said ~~original~~ one or more instances of said electronic document has a document scheme similar to said determined document scheme,

means for creating said virtual page from said retrieved one or more virtual tag objects and said most recent version of said ~~original~~ one or more instances of said electronic document, if said more recent version of said original electronic document has a document scheme similar to said determined document scheme; or

means for revising said virtual tags and said one or more transformation rules, if said ~~subsequent original~~ more recent version of said one or more instances of said electronic document does not have a document scheme similar to said determined document scheme; and

means for creating said virtual page from said most recent version of said ~~original~~ one or more instances of said electronic document with said revised one or more virtual tags and said revised one or more extraction rules.

88. (Currently amended) The computer program product of claim 87 further comprising:

means for marking said virtual tags and said transformation rules as expired if said ~~subsequent original~~ more recent version of said one or more instances of said electronic document does not have a document scheme similar to said determined document scheme.

89. (Original) The computer program product of claim 70 further comprising:

means for monitoring consecutive instances of said stored one or more virtual tags;

means for categorizing the type of said stored one or more virtual tags having consecutive instances with characteristics to form a definition for said one or more virtual tags; and

means for matching related one or more virtual tags to form a virtual link in said virtual tag repository.

90. (Original) The computer program product of claim 70 wherein said virtual tag object is formatted as an extensible markup language (XML) view.

91. (Original) The computer program product of claim 67 wherein said visual representation is accessed with a graphical user interface.

92. (Original) The computer program product of claim 67 wherein said graphical user interface includes a proxy for monitoring actions of said user.

93. (Original) The computer program product of claim 70 further comprising:  
means for monitoring the one or more virtual tags and the one or more transformation rules.

94. (Original) The computer program product of claim 93 wherein said monitoring means provides microstatistics of the use of said one or more virtual tags and said one or more transformation rules.

95. (Original) The computer program product of claim 93 wherein said monitoring means provides monitoring of a user subscription to said one or more virtual tags or one or more transformation rules.

96. (Original) The computer program product of claim 93 wherein said monitoring means further comprises means for sending a message to a content provider after creation of predefined one or more of said virtual tags.

97. (Original) The system of claim 70 wherein said one or more virtual tags previously constructed are used for constructing one or more new virtual tags and one or more new transformation rules.

98. (Original) The computer program product of claim 67 further comprising:  
means for linking said transformation rules to parameterized pages.

99. (Original) The computer program product of claim 67 wherein said original electronic document is a chapter of a book and said second electronic document is a plurality of chapters of said book.

100. (New) The method of claim 1 further comprising the steps of:



a user approving said visual representation of said virtual page; or

a user disapproving said visual representation of said virtual page, wherein when said visual representation is disapproved, revising said one or more virtual tags or transformation rules to form revised virtual tags or revised transformation rules and applying said one or more revised virtual tags and said one or more revised transformation rules to said one or more instances of said electronic document, said second electronic document having a similar structure as said one or more instances of said electronic document or said future versions of said one or more instances of said electronic document.

101 (New) The system of claim 34 comprising:

means for approving said visual representation of said virtual page; or

means for user disapproving said visual representation of said virtual page, wherein when said visual representation is disapproved revising said one or more virtual tags or said transformation rules to form revised virtual tags or revised transformation rules and applying said one or more revised transformation rules to said one or more instances of said electronic document, said second electronic document having a similar structure as said one or more instances of said electronic document or said future versions of said one or more instances of said electronic document.